

SECTION 152 HOT BITUMINOUS EQUIPMENT

152.01 REQUIREMENTS FOR ALL MIXING PLANTS.

- A. **General.** Intermingling of aggregate sizes shall be prevented by providing adequate space between stockpiles. Various plant units shall be designed and coordinated to permit uniform, uninterrupted production under normal operating conditions and shall be capable of accurately calibrating and checking the proportions of each ingredient used in the mixture.
- B. **Storage and Heating Equipment.** Storage tanks shall uniformly heat the bitumen to the required temperature range, without damaging or changing its characteristics. Direct flame against the storage tanks will not be permitted. The tank shall be equipped with a thermometer that accurately registers the temperature of the bitumen. The Contractor shall provide measuring sticks and outage tables for accurately calibrating the tanks and checking the quantity of material in the tanks at any time. Bitumen storage or supply facilities shall adequately supply material so the plant can operate at full capacity without interruption.
- C. **Feeders.** The plant shall have an accurate mechanical means for feeding aggregates into the drier so uniform production and temperature is obtained.
- D. **Drier.** The plant shall include one or more driers which continuously agitates, heats, and dries the aggregates as specified.
- E. **Thermometric Equipment.** Temperature recording equipment shall be furnished that automatically and continuously records the mix temperature as it is discharged from the plant. The equipment shall record temperature variations of 20°F. within one minute of the time the variation occurs. The mechanism shall be accessible; have a transparent, dust-proof cover; and be located where it is unaffected by plant vibration. The mix temperature of each day's production shall be automatically recorded on a chart or charts suitably graduated to permit determination of time within 15 minutes and temperature within 10°F. The charts shall be submitted to the Engineer daily.
- F. **Flow Rate Meter.** The quantity of asphalt cement being discharged into the mixer shall be measured by a flow rate meter with totalizer, permanent recorder, and temperature compensation capabilities. The totalizer shall have the capacity of recording 1,000,000 gallons with a certified accuracy of $\pm 0.20\%$. The flow rate meter and totalizer shall be temperature-corrected automatically to 60°F. within an operational range of 60° to 450°F.

The flow rate meter shall continuously display and permanently record on a chart or printout the asphalt percentage of the total mix on a time-coordinated basis. The

maximum chart increments shall be 0.10% of the total mix. If the flow varies by more than ± 0.25 percentage points from the set percentage of asphalt, the Contractor shall correct the oil variance. The Contractor shall have 1/2 hour after the first start up of the day and 5 minutes after any additional start up to adjust the plant to meet the tolerance. The recorder shall be accessible to the Engineer at all times, and the record of each day's operation shall be submitted daily to the Engineer.

The Contractor shall calibrate the flow meter for accuracy before the start of each Project and as necessary during the course of the Project to assure the specified accuracy. The Contractor shall make available to the Engineer a copy of the operations manual of the flow meter.

- G. **Emission Control.** Scrubbers or similar devices shall be used to meet pollution standards. Liquids from a wet scrubber shall not be discharged into a live stream, lake, or pond. The effluent shall be circulated through sludge pits or tanks. The resultant sedimentation, together with all other waste material developed by crushing and mixing operations, shall be contained or otherwise acceptably disposed of.
- H. **Cold-Feed Control.** When aggregate is handled by cold-feed control, all plant screens are removed with the exception of a scalping screen used to prevent oversize rock from entering the mix. The scalping screen's opening size shall not exceed the mix's maximum size aggregate plus 1/2 inch. A mechanical feeder having a separate bin for each aggregate to be blended in the mixture shall be provided. Each bin shall be equipped with dividers to prevent overflow of aggregate to adjacent bins, and shall have a separate and positive feed control that can be easily and accurately calibrated. The feed shall be quick-adjusting, and shall maintain a constant and uniform flow of aggregate throughout the range of its calibration.

152.02 SAMPLING DEVICES FOR MIXING PLANTS.

The plant shall be equipped for readily obtaining a representative sample of each size of aggregate, or of the combined aggregate before the aggregate enters the mixing unit.

The Engineer shall have the right to obtain an aggregate sample at any time during the mixing operation. The Contractor may stop the belt entering the mixing plant to allow the inspector to remove a sample or provide a sampling device that is easily operated by the inspector without interrupting the mixing plant operation.

The sampling device shall be approved by the Engineer before the mixing plant is approved for use on the Project.

152.03 SPECIAL REQUIREMENTS FOR BATCH MIX PLANTS AND FOR CONTINUOUS MIX PLANTS.

The batch-type hot mix plant and the continuous type hot mix plant shall meet Section 152.01 of these Specifications except Section 152.01 F., and shall meet Section 152.02 of these Specifications and the requirements of AASHTO M-156.

152.04 SPECIAL REQUIREMENTS FOR DRUM-DRYER MIXING PLANTS.

- A. **General.** The drum-dryer hot mix plant shall meet Sections 152.01 and 152.02.

The drum-dryer mixing process shall provide positive weight control of the cold aggregate feed with a belt scale or other device to automatically regulate the feed gate and permit instant correction of variations in load. The cold-feed flow shall be automatically coupled with the bitumen flow to maintain the required proportions. The system shall be equipped with automatic burner controls and shall provide for temperature sensing of the bituminous mixture at discharge.

The Contractor shall have, for review by the Department, a copy of the manufacturer's manual for the plant. The pitch of the drum shall be no greater than 3/4 inch per foot or as recommended by the manufacturer.

When plant production is changed during normal operations, the temperature of the mix shall be maintained within 20°F. of the average temperature of the mix produced within the preceding 1/2 hour of the plant production change.

- B. **Surge Bins.** The plant shall have adequate bin storage for the hot mix to ensure continuous production operations. Surge bins for hot storage shall have batchers, baffle plates, or other approved devices to minimize segregation during loading and unloading. Surge bins which permit an uninterrupted free fall of material from the loading conveyor shall not be used.

152.05 MILLING MACHINE.

The milling machine shall be a self-propelled machine specifically designed to mill and remove existing asphalt pavement to a specified depth, profile, cross slope, and surface texture. The machine shall be of a size, shape, and dimensions which does not interfere with safe traffic passage adjacent to the work.

The machine shall have a control system to automatically control the elevation and transverse slope of the milling head. A 15-foot minimum length skid, rolling straight-edge or other approved device shall be used to establish the grade reference for control of the milling head. The system shall permit the grade reference device to operate on either side of the milling machine, and shall maintain the desired transverse slope regardless of changes in the elevation of the milling head.

Conveyors capable of side, rear, or front loading shall be provided with the necessary equipment to transfer the milled material from the roadway to a truck.

152.06 ASPHALT TRANSPORTER.

Tank trucks used to transport bituminous material shall be sealed at the refinery and shall be equipped with a bitumen sampling valve. This valve shall be conveniently located for sampling, preferably in the lower half of the rear bulkhead and at least one foot from the shell. The valve shall be inside the tank with the valve stem and outlet extending outside the tank.

SECTION 153 PORTLAND CEMENT CONCRETE EQUIPMENT

153.01 BATCHING AND WEIGHING EQUIPMENT.

- A. **General.** The batching plant, including its supports and foundations, shall be designed to safely withstand any operating stresses. The plant shall be leveled to